The dependence on voltage in Equations 2 and 3 ensure that the wind turbine enters and exits Region 4 at a consistent power output level and that the power level for Region 4 does not change with battery voltage. If the wind turbine is connected to an inverter and the output power is fed into a utility grid, then the DC voltage would be constant and would be regulated by the grid voltage of the AC utility system. In that case, the value of V in Equations 2 and 3 would be a constant value based on the AC grid voltage. In that case, the dependence on voltage would disappear from Equations 2 and 3 and the criteria for entering and exiting Region 4 would only depend on the wind turbine's rotor speed.

Figure 10 shows a flow chart outlining the control algorithm for the controller of the present invention. At each control cycle, the controller measures the rotor speed and the battery voltage and determines the appropriate operating region based upon that information. If the wind turbine is in Region 1, then the duty cycle is set to 0% and the controller returns to begin the next control cycle. If the wind turbine is in Region 2, then the duty cycle is calculated based on Equation 1. If the duty cycle is negative, or if it is greater than a predetermined maximum duty cycle, then the duty cycle is either set to 0% or the maximum value. While the controller is in Region 2, the pulse width modulation switching frequency of the FETs is constantly adjusted to avoid acoustic noise. After adjusting the switching frequency, the controller returns to begin the next control cycle. If the wind turbine is Region 3, the duty cycle is set to 0% and the controller returns to begin the next control cycle. If the wind turbine is in Region 4, then the duty cycle is set to 65% and a 15 second delay is initiated. After the 15 second delay, the controller enters into a loop that monitors the rotor speed and battery voltage. The duty cycle is

maintained at 65% until the wind speed drops and the rotor speed drops below the value prescribed in Equation 3.

While preferred embodiments of the invention have been shown and described, it will be apparent to those skilled in the art that various modifications may be made in these embodiments without departing from the scope of the invention. Therefore, it is intended that the invention not be limited to the particular embodiments disclosed but that the scope of the invention be defined by the following claims.